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Virtual brush: a model-based synthesis of Chinese calligraphy

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Abstract

This paper describes the *Virtual Brush*, a model-based approach to synthesizing realistically Chinese calligraphic writings. This approach simulates the physical process of brush stroke creation using a parameterized model which captures (a) the writing brush 3D geometric parameters, (b) the brush hair properties and (c) the variations of ink deposition along a stroke trajectory. An analysis of some well-known Chinese brush writing styles is given, with a view to establishing the relationship of these writing styles and the modeling process of simulating these different writing styles. We present here our model formulation and the implementation of a software which is capable of simulating some typical calligraphic writing styles on a PC platform. This parameterized model allows a compact representation for brush-written characters which can be used to synthesize characters at different levels of detail, with various brush effects. The result is applicable for very high-quality publishing purpose. Additionally, by appropriately transforming and scaling the stroke trajectories which define a virtual brush character

transforming and scaling the stroke trajectories which define a virtual brush character, this technique can be used as a novel approach for scalable font design and generation, in comparison with traditional vector fonts or imaging techniques. More interestingly, with suitable interfacing techniques *Virtual Brush* would allow users to “practice” calligraphy electronically.



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